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Respiratory tract infections in children in the community: prospective online inception cohort study

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ABSTRACT

Purpose To describe the duration, cost and proportion consulting for respiratory tract infections (RTIs) in children in the community

Methods Community based, prospective, online inception cohort study. GPs from socioeconomically diverse practices posted study invitations to parents of 10,310 children aged ≥3 months and <15 years.

Results One parent of 485 (4.7%) children in 331 families consented, completed baseline data and symptom diaries, and agreed to medical record review. Compared to non-responders, responding children were younger (4 vs. 6 years) and less socioeconomically deprived. Between February and July 2016, 206 parents reported 346 new RTIs in 259 children. Among the 197 first RTIs per family, it took 23 days for 90% (95% CI 85% to 94%) of children to recover. Median symptom duration was: longer in consulting (9 days) vs. non-consulting (6 days) children (p=0.06); children ≤3 years (11 days) vs. >3 years (7 days, p<0.01); and among children whose parents reported lower (12 days) vs. exclusively upper (8 days) RTI symptoms (p<0.001). Sixteen (8.1%, 95% CI 4.7% to 12.8%) of 197 children consulted primary care at least once (total 19 contacts), and a similar proportion had time off school or nursery. Sixty of 188 (32%, 95% CI 25% to 39%) parents reported paying for medications for their child's illness.

Conclusions Parents can be advised that RTI symptoms can last up to three weeks. Policy makers should be aware that parents may seek primary care support in at least 1 in 12 illnesses.

243 words

Keywords Pediatrics, respiratory tract infections, primary care, antibiotics

INTRODUCTION

Self-care is central to sustainable primary care.[1 2] Accurate knowledge regarding RTI symptoms and their duration is an essential part of self-care,[3] supporting patients to know when to seek help.[4] A recent systematic review[5] estimated children's RTI duration using 48 studies, but the majority of studies were conducted in a consulting population whose illness characteristics are likely to differ from the non-consulting population.

Policy makers currently measure primary care antibiotic prescribing as the absolute number of prescriptions issued[6] or, where diagnostic codes are reliable, as a percentage of infection consultations.[7] However, neither measure is sensitive to the number of people falling ill, who might require primary care and antibiotic treatment. To fully understand changes in antibiotic prescribing, measures of three elements are required: the number of people falling ill; the proportion of these choosing to consult primary care; and the proportion of these who are prescribed an antibiotic. The first and second elements cannot be measured using currently available clinical datasets, and would require bespoke data collection mechanisms.

We aimed to demonstrate the feasibility of measuring the first and second elements using online methods - to recruit and follow up a cohort of children in the community as they fall ill with RTIs. The feasibility results (including microbiological elements and a qualitative evaluation) will be reported elsewhere, but since even demonstrating feasibility required the recruitment of a few hundred families, the present paper reports our findings on three other study objectives: (i) to estimate the duration of community RTI symptoms in children; (ii) to estimate the proportion of parents seeking primary care help when their child develops an RTI; and (iii) to estimate the costs of RTIs to families (since costs of RTIs have similarly only been estimated in consulting populations).[8]

METHODS

Design, setting and participant recruitment

This was a community based, online, prospective inception cohort study. Recruitment methods are described in detail elsewhere.[9] Briefly, GP practices serving a broad range of socioeconomic populations within 10 miles of Bristol city were invited to express interest via the NIHR Clinical Research Network. Participating practices identified children aged ≥3 months and <15 years and using medical record diagnostic codes, excluded immune-compromised children, and those with terminal illnesses. The practices sent all parents/carers (from here on 'parents') of remaining children a study information sheet, invitation letter, consent form and (for children >7 years) a child friendly information sheet and assent form. The posting of study paperwork was staggered between 26 February and 1 July 2016 to prevent study team overload.

Baseline and follow up data collection

One parent per household returned signed consent (and assent) forms to the study team using pre-paid envelopes. On receipt, the team telephoned the parent to confirm eligibility and provide instructions regarding baseline data completion online (including parent and household demographics), at which point the child was 'enrolled'. Parents of children with RTI symptoms at enrolment were advised to report when that illness had resolved and invited to start the study processes at the onset of the next illness.

The study database generated weekly parent emails/texts asking parents to respond 'no/yes' if their child had developed new RTI symptoms (blocked/runny nose; earache/ear discharge; sore throat; cough; chesty symptoms [breathing faster than normal; wheeze or whistling chest]). A negative response resulted in no further action. With a positive response, parents were invited to record daily (online) the presence and severity of the above symptoms, along with the constitutional symptoms (fever/chills, fatigue, disruption to sleep, and disruption to other usual activities). Symptom severity was scored using a validated[10] Likert scale format: zero (normal or no problem) to six (as bad as it could be). To minimise respondent burden, parents were invited to report the presence and severity of the same symptoms on a weekly basis for RTI episodes lasting more than 21 days. Data were collected on new (parent-reported) RTI symptoms starting before 31 July 2016 and all children were followed until symptom resolution.

At the end of each week of symptoms (or on confirmation of symptoms resolution), parents were asked to report whether the child had been kept off school/nursery, if the parent took time off work due to the RTI, and to provide the number of days of school/nursery or hours of work missed. Parents were also asked to report how much they spent on medications. Primary care contacts (including telephone calls and Emergency Department visits) and antibiotic prescriptions were recorded by review of the child's primary care notes.

Statistical methods

Sample size calculation

There is little contemporaneous evidence to inform a paediatric study of consultation rates. Recent UK survey data suggest around 20% of adults with RTI in the community consult.[11] With 300 RTI episodes, we would have ±5% precision around a 20% point estimate for consultation rates (95% CI of 15% to 25%), using the exact binomial calculation. For symptom duration, with the same number, we would have ±3% precision around the 90% of children recovered (95% CI of 87% to 93%). The time taken for 90% of children to recover was considered the most useful cut-point in previous studies.[12 5]

Derivation of variables

RTI duration was calculated as the time between the first and last days (preceding two consecutive symptom free days) any symptom was reported. For RTI episodes lasting more than 21 days we calculated the end date as the mid-point between potential minimum and maximum end dates. RTIs were categorised as being either 'upper' when only earache, sore throat, runny/blocked nose, ear discharge, dry cough or barking/croupy cough were reported, or 'lower' when additionally wet/ productive cough, breathing faster/ shortness of breath, or wheeze/ whistling chest were present.

Data analyses

All analyses were performed using Stata version 14.1. Main analyses were restricted to the first RTI occurring within families to avoid within-family and within-child clustering. The duration of each RTI episode was treated as a survival outcome. Where symptom resolution was not reported, time analyses were censored on the last known symptomatic day. Median duration of RTI was estimated, as were 10th, 25th, 75th and 90th percentiles. Symptom duration was stratified according to whether the parent attended primary care with the child and whether any lower respiratory tract symptoms were reported. Finally, the impact of upper vs. lower respiratory tract infection status on constitutional symptoms was

investigated by calculating the mean of the maximum constitutional symptom scores by RTI type. Percentages were used to describe primary care consultation behaviour between the illness start and end dates.

Effects of sample generalisability on symptom duration and the proportion consulting

As the final analytic sample was relatively young and less deprived in comparison to invited children,[*ref feasibility paper results, to be published*] we investigated how measures of age and deprivation (using the Index of Multiple Deprivation[13] and parent education) affected RTI duration and consultation behaviour. The log-rank test for equality of survivor functions was used to assess if these explanatory variables influenced duration as a survival outcome. We also assessed whether parent or child-level baseline characteristics were associated with consultation using chi-squared tests for categorical variables and Wilcoxon rank-sum tests for continuous variables.

Sensitivity analyses

These assessed the stability of symptom duration estimates to within-family and within-child clustering by respectively using data from the first RTI per child and all RTIs.

RESULTS

Practice and child recruitment

Fifty-four GP practices were invited, 19 expressed interest of whom ten agreed to participate and five were selected for socio-economic diversity. Each practice sent invitations in a single batch, the first the week commencing 26 February 2016, and the second to fifth on the weeks commencing 4 March, 11 March, 15 April and 20 May. A total of 10,310 invitations were sent, with 331 parents (one per household) consenting and completing baseline data for 485 'enrolled' children (Figure 1). The number enrolled from the five practices were 175, 140, 75, 51, and 42; and the number of children were enrolled by month was 17 (February), 103 (March), 114 (April), 165 (May), 85 (June) and 1 (July).

Compared to children who parents did not respond, enrolled children were younger (median 4 vs. 6 years) and less socio-economically deprived (Web Table 1). During follow up (to 31 July), 206 parents (one per household) reported 346 new RTI episodes, in 259 children. Parents reported 187 children had one RTI, 75 children had two, and 15 children had three RTIs.

Description of children and families

206 first RTI episodes were reported per family. Parents' median age was 38 years, most were female (94%), most self-reported ethnicity as white (88%), and most were in full or part time employment (74%, Table 1). Most (86%) were educated to under or postgraduate degree level, and 20% reported receiving medical or nursing training. Symptom diaries were completed with illness start and end dates in 197 (96%) and 180 (87%) respectively. Aside from education level, there was no evidence of differences in parent characteristics between those fully completing and not starting the symptom diaries (Table 1). Similarly, there was no evidence of differences in children's characteristics (Table 1): median age was 3 years, 55% were female, 90% white, 9% had asthma and 59% had one or more siblings.

Symptom duration and severity

Survival analyses were restricted to the first 197 episodes per family for which a start date was recorded. Median RTI duration was 9 days (IQR 7-14 days) and it took 23 days for 90% (95% CI 85% to 94%) of children to recover (Table 2, Figure 2). There was modest evidence that RTI duration differed between consulting and non-consulting children, with medians of 13 and 9 days and 90th percentiles of 37 and 21 days, p=0.06 (Table 2).

Parents reported exclusively upper respiratory tract symptoms in 86 (45%) and one or more lower respiratory tract symptoms in 104 (55%) children. There was strong evidence that illnesses in which lower respiratory tract symptoms were reported were associated with longer illnesses compared to exclusively upper respiratory symptoms, with medians respectively of 12 and 8 days and 90th percentiles of 15 and 29 days, $p<0.01$ (Table 2). Parental reporting of lower respiratory tract symptoms was associated with a doubling of mean maximum constitutional symptom scores compared with upper respiratory illnesses (Table 2). Mean symptoms' severities for children with exclusively upper respiratory tract symptoms show the most persistently severe symptom was runny nose while the fastest to resolve was earache (Web Appendix Figure 1). For children with at least one lower respiratory tract symptom all symptoms persisted for three weeks with runny nose and wet cough being the most severe (Web Appendix Figures 2a and 2b).

Impact on school/nursery and time off work

Seventeen of 188 (9.0%, 95% CI 4.9% to 13.1%) responding parents reported a school/nursery absence during the first week of symptoms. The mean number of absence days in the first week was 2 (range 0.5 to 5). Only two parents reported any absences (totalling 1.5 days) after the first week. Five of 188 (2.7%, 95% CI 0.3% to 5.0%) parents reported taking time off work during the first week, with a mean of 14.8 (range 4 to 24) hours lost. One parent reported time off work (7 hours) after the first week.

Primary care attendances

Of the 197 first RTI episodes per family, primary care medical notes reviews showed 16 (8.1%, 95% CI 4.7% to 12.8%) resulted in at least one primary care consultation between illness start and end dates (Table 3), of which 14 were face to face GP consultations and two were Emergency Department attendances. Three of the primary care consultations resulted in an antibiotic prescription (all amoxicillin). There were no hospital admissions, and in total there were 19 primary care contacts, equivalent to 9.6 consultations per 100 RTI episodes. Consultation rates per 100 symptomatic RTI weeks were: 5.1 in illness week 1; 4.0 in illness week 2; 5.3 in illness week 3; 5.3 in illness week 4; and 14.3 in illness week 6 (there were no consultations in week 5). Sixty of 188 (31.9%, 95% CI 25.2-38.6%) of responding parents reported paying for new medications for their child's illness. For these parents, the mean amount spent over course of the illness was US$8.12 (range US$1.42 to US$55.5).

Effects of sample generalisability on symptom duration and the proportion consulting

Univariable analyses showed no evidence that maternal measures of deprivation or education were associated with either symptom duration or the proportion consulting (Table 3). There was evidence that younger children (<3 years) had longer illnesses than older children - median symptom durations 11 and 7 days, $p<0.01$ (Table 3). Child's age was not associated with primary care attendance.

Sensitivity analyses

Estimates of overall symptom duration were stable when taking account of within-family and within-child clustering. The modest differences in symptom duration observed between consulting and non-consulting children in the main analyses were augmented as a result of within family (parent) clustering (Table 4).

DISCUSSION

Summary of main results

In this community based, prospective, online inception cohort study drawn from five GP practices in Bristol, UK we showed it takes up to three weeks for 90% of children's RTI symptoms to resolve. There was modest evidence of longer symptom duration in consulting vs. non-consulting children and strong evidence of longer symptom duration in children with lower vs. upper RTI symptoms. One in 12 parents sought help from primary care.

Strengths and limitations

To our knowledge, this is the first community based, inception cohort study to use online methods to measure symptom duration, costs and primary care help seeking behaviour, providing new knowledge of relevance to clinicians and policy makers. Conducting the study in the UK was ideal since unlike some healthcare systems (the US for example), we have near universal population primary care registration. Previous studies have not compared symptom duration in consulting and non-consulting children, and to our knowledge no previous study has demonstrated the prognostic value of parent reported lower respiratory tract symptoms.

We are aware of several limitations. First, the initial invitation response rate was low. Responding parents had younger children and were less socio-economically deprived than non-responding parents, though our study response rate was nearly double that of another study using similar methods[14], and our consultation rate estimate was not univariably associated with deprivation and age. Twenty percent of parents reported medical or nursing training, suggesting families with higher medical knowledge than the general population were recruited. Second, our observation period was relatively short and included some summer months. This limited our ability to investigate seasonal variation and would be more likely to result in the inclusion of allergic conditions. Third, we did not achieve the expected sample size. Although the precision of our symptom duration and consultation rate estimates were not materially affected, this prevented us from using hierarchical modelling to control for clustering by recruitment practice and meant we had insufficient numbers to conduct the multivariable modelling that would be required to robustly confirm the effect of maternal deprivation and education on symptom duration and consultation. Fourth, symptom duration estimates could have been influenced by: (i) younger children with longer illnesses who were more likely to participate in the study (leading to an overestimation of symptom duration); (ii) parents might have tired of completing symptom diaries for longer illnesses

(underestimation); and (iii) our analyses presented all respiratory symptoms combined, with shorter symptoms hidden by longer symptoms (overestimation). Fifth, among those in whom no new respiratory symptoms were reported, we are unable to distinguish between parents not responding, and those responding 'no new symptoms'. Finally, the consultation rate may be an underestimate since ours was a relatively medically aware, affluent population, and previous research[15] has suggested consultation rates are likely to be higher in less affluent families.

Comparison with existing literature

Symptom duration for both longer (such as cough) and shorter (ear pain) symptoms were similar to those observed in our 2013 systematic review.[5] There is very little evidence with which to compare paediatric consultation rates.

Implications for public health, clinical practice and research

Knowledge of RTI symptom duration in a non-consulting population could inform GP practice/ public health interventions to help parents know how long respiratory symptoms can last, ideally while also providing information regarding the concerning symptoms for which parents should consult. Similarly, such interventions could advise parents to expect longer and more severe illnesses if children have lower respiratory symptoms. Clinicians conducting telephone triage could also provide additional reassurance to parents reporting exclusively upper respiratory symptoms.

Although the 8% consultation rate per illness episode could be an underestimate, it suggests there is a significant 'illness iceberg'. Policy makers, clinicians and directors of public health need to be mindful of unintentionally lowering the consultation threshold and increasing the percentage of parents consulting.

Future studies should be larger (to have sufficient numbers to use multivariable modelling to identify the social, psychological and clinical factors[16] associated with consulting, and confirm the modest evidence of shorter illnesses in non-consulting children observed here) and monitor illnesses over longer time periods (in order to understand seasonal variation, which could vary with differing circulating microbes). Future research should also measure and report individual symptom duration in more detail, and comparative studies are needed in different countries and healthcare settings.

Conclusions

Parents can be advised that RTI symptoms in children can last up to three weeks. Policy makers should be aware that parents may seek primary care support in at least 1 in 12 illnesses.

ADDITIONAL INFORMATION

Funding, ethical approval and sponsorship

This study was partly supported by the NIHR Health Protection Research Unit in Evaluation of Interventions at University of Bristol. The views expressed are those of the author(s) and not necessarily those of the NHS, the NIHR, the Department of Health or Public Health England. The Bristol Randomised Trials Collaboration (BRTC) has contributed funding and input into study outputs via development work on the database system used to coordinate the study and collect data from participants. ADH was funded by NIHR Research Professorship (NIHR-RP-02-12-012).

The South West Frenchay Bristol Research Ethics Committee approved the study (reference: 15/SW/0264), and research governance approvals were obtained prior to recruitment. All participants' parent or legal carers gave written, informed consent on behalf of the child. All children aged 7 years by September 2015 (equivalent of school year 3) and over gave informed assent. The study was sponsored by the University of Bristol, which ensured the study met all regulatory approvals.

Competing interests

Peter Muir has received funding, conference expenses and fees during the past five years from medical diagnostics companies who are active in developing or marketing in vitro diagnostic devices for diagnosis of respiratory tract infections, including Nanosphere Inc. and Hologic Inc. All other authors declare they have no competing personal or financial interests.

Authors' contributions

ADH and WH were responsible for developing the research question, securing funding and the study design. All authors were responsible for data collection. EA and ADH were responsible for study management and co-ordination. SI and WH were responsible for data analysis. ADH, EA, SI and WH drafted the paper. All authors have commented on and approved the final manuscript.

ADH (corresponding and guarantor author) affirms that the manuscript is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned (and, if relevant, registered) have been explained.

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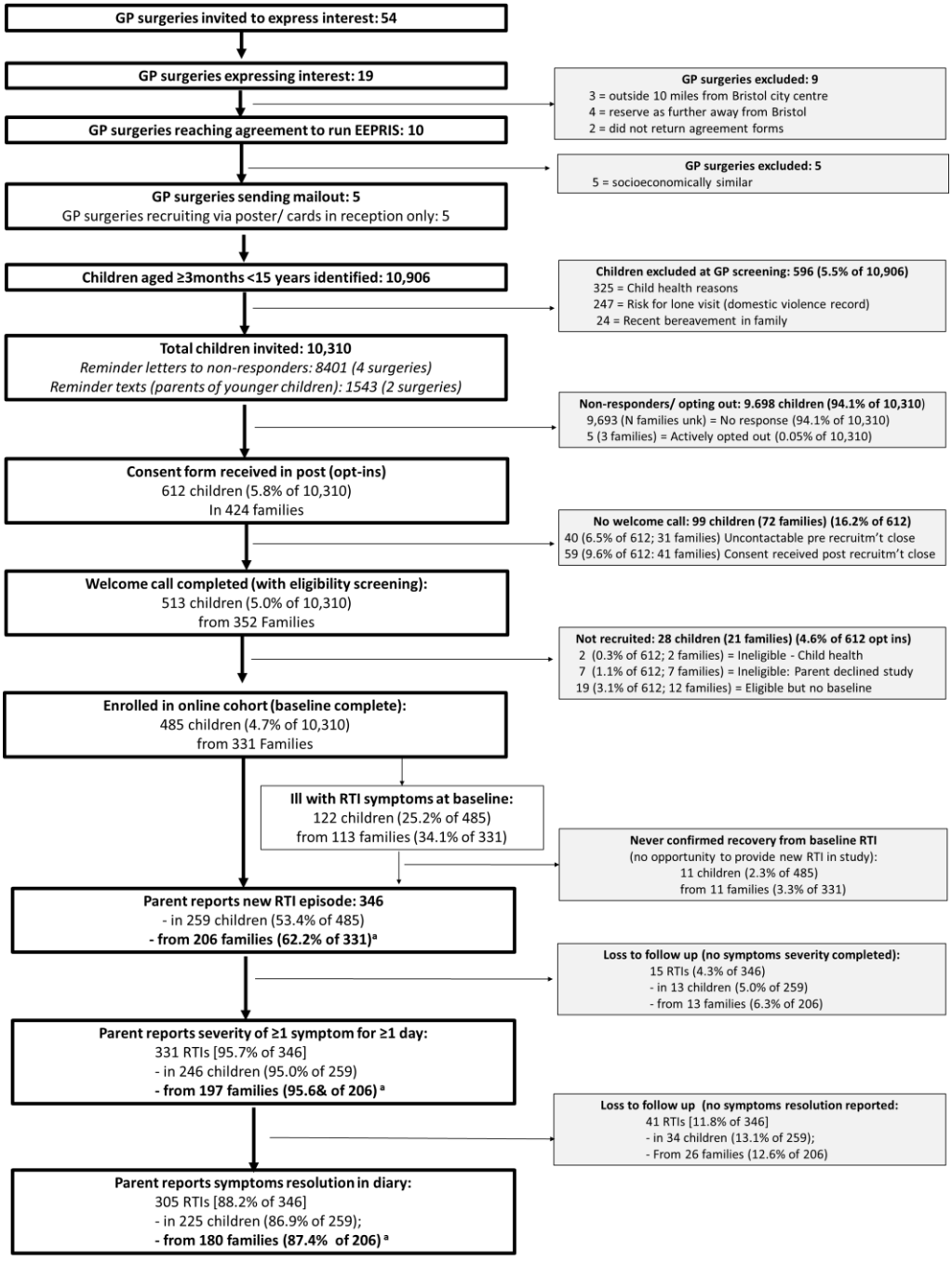
FIGURES AND TABLES

Figure 1. Flow diagram of participant recruitment



RTI = respiratory tract infection. 'Surgeries' refer to 'practices'

[a] Refers to first RTIs per family - used for symptom duration and consultation analyses

Figure 2. Kaplan Meier curve showing time to RTI symptom resolution (with number censored), restricted to first RTI per family with illness start date (n=197)

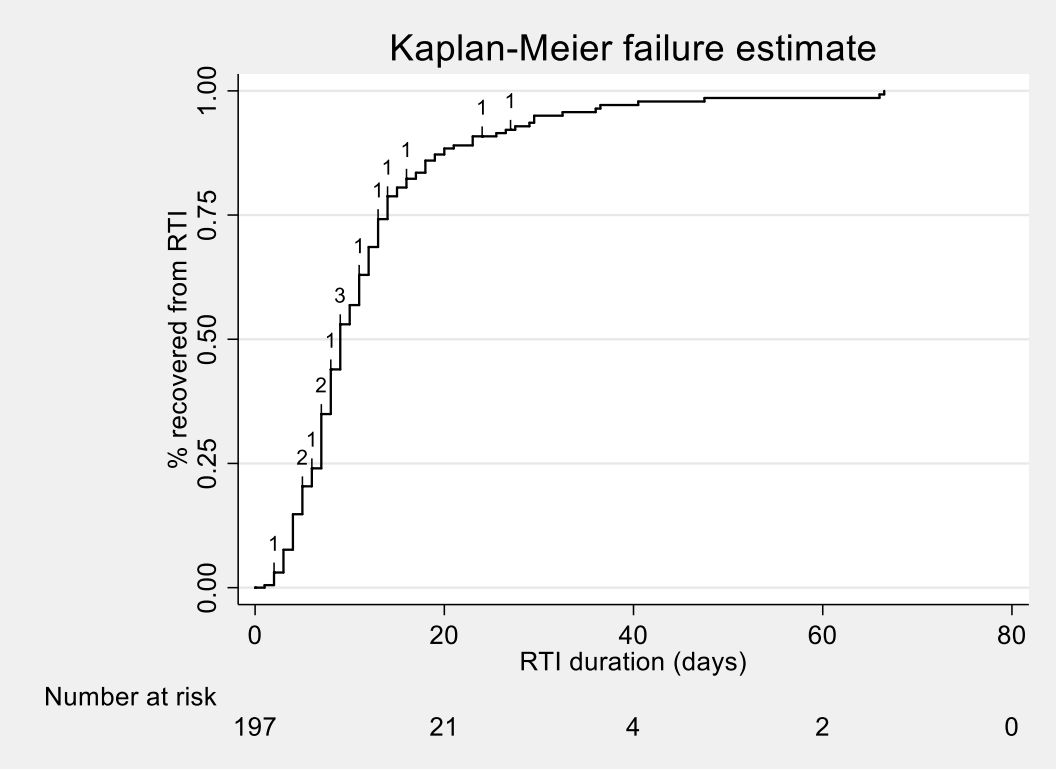


Table 1. Baseline characteristics of parents, children and households, according to whether or not symptom diary completed; restricted to first RTI episode per family (n=206)

		Symptom diary start and end dates complete?	
	First RTI per family n=206 (%)	***No (n=26)***	***Yes (n=180)***
PARENT			
Gender			
Missing	2 (0.97)		
Female	193 (93.69)	26 (100)	167 (93.82)
Male	11 (5.34)	0 (0)	11 (6.18)
Age, years (median, IQR)	38 (34-43)	36 (34-41)	38 (34-43)
Missing	9 (4.37)		
Ethnicity			
Missing	9 (4.37)		
Asian	5 (2.43)	0 (0)	5 (2.91)
Black	5 (2.43)	2 (8.00)	3 (1.74)
Mixed	5 (2.43)	1 (4.00)	4 (2.33)
White	182 (88.35)	22 (88.00)	160 (93.02)
Employment			
Missing	9 (4.37)		
Full time parent/care-giver	34 (16.50)	4 (16.00)	30 (17.44)
In full time education	2 (0.97)	0 (0)	2 (1.16)
Not currently employed	8 (3.88)	2 (8.00)	6 (3.49)
Working full time	41 (19.90)	7 (28.00)	34 (19.77)
Working part-time	112 (54.37)	12 (48.00)	100 (58.14)
Education			
Missing	9 (4.37)		
No official qualification	2 (0.97)	0 (0)	2 (1.16)
Up to GCSEs/GCEs/'O' Levels or equivalent	8 (3.88)	4 (16.00)	4 (2.33)
'A' Levels/NVQs/GNVQs or equivalent	9 (4.37)	2 (8.00)	7 (4.07)
First degree/diploma/HNC/HND	107 (51.94)	11 (44.00)	96 (55.81)
Higher degree (e.g. MSc, PhD)	71 (34.47)	8 (32.00)	63 (36.63)
Any medical/ nursing training			
Missing	9 (4.37)		
No	155 (75.24)	22 (88.00)	133 (77.33)
Yes	42 (20.39)	3 (12.00)	39 (22.67)
CHILD			
Age, years (median, IQR)	206	3 (1-6)	3 (1-7)
Gender			
Female	114 (55.34)	15 (57.69)	99 (55.00)
Male	92 (44.66)	11 (42.31)	81 (45.00)
Ethnicity			
Asian	6 (2.91)	1 (3.85)	5 (2.78)
Black	5 (2.43)	1 (3.85)	4 (2.22)
Mixed	11 (5.34)	3 (11.54)	8 (4.44)
White	184 (89.32)	21 (80.77)	163 (90.56)

Other	0		
Asthma			
No	187 (90.78)	22 (84.62)	165 (91.67)
Yes	19 (9.22)	4 (15.38)	15 (8.33)
Eczema			
No	128 (62.14)	18 (69.23)	110 (61.11)
Yes	78 (37.86)	8 (30.77)	70 (38.89)
Hayfever			
No	186 (90.29)	22 (84.62)	164 (91.11)
Yes	20 (9.71)	4 (15.38)	16 (8.89)
Child receiving any breast milk at 3 months			
Don't know	2 (0.97)	1 (3.85)	1 (0.56)
No	30 (14.56)	4 (15.38)	26 (14.44)
Yes	174 (84.47)	21 (80.77)	153 (85.00)
Child attending school			
No	125 (60.68)	15 (57.69)	110 (61.11)
Yes	81 (39.32)	11 (42.31)	70 (38.89)
Child attending day-care regularly			
Not relevant (attends school)	81		
No	36 (28.80)	6 (40.00)	30 (27.27)
Yes (1-2 days per week)	50 (40.00)	6 (40.00)	44 (40.00)
Yes (3-5 days per week)	39 (31.20)	3 (20.00)	36 (32.73)

HOUSEHOLD

Bedrooms			
1	4 (2.03)	2 (8.00)	2 (1.16)
2	47 (23.86)	5 (20.00)	42 (24.42)
3	86 (43.65)	9 (36.00)	77 (44.77)
4	42 (21.32)	6 (24.00)	36 (20.93)
5	14 (7.11)	3 (12.00)	11 (6.40)
6	3 (1.52)	0 (0)	3 (1.74)
7	0 (0)	0 (0)	0 (0)
8	1 (0.51)	0 (0)	1 (0.58)
Missing	9		
Resident smoker			
Missing	9		
No	181 (91.88)	22 (88.00)	159 (92.44)
Yes	16 (8.12)	3 (12.00)	13 (7.56)
Cat/dog in main home			
Missing	9		
No	141 (71.57)	16 (64.00)	125 (72.67)
Yes	56 (28.43)	9 (36.00)	47 (27.33)
Number of adults resident in child's main home			
Missing	9		
0	1 (0.51)	0 (0)	1 (0.58)
1	15 (7.61)	2 (8.00)	13 (7.56)
2	164 (83.25)	20 (80.00)	144 (83.72)
3	11 (5.58)	0 (0)	11 (6.40)
4	5 (2.54)	3 (12.00)	2 (1.16)
8	1 (0.51)	0 (0)	1 (0.58)
Total number of children in home			

Missing	9		
1	80 (40.61)	8 (32.00)	72 (41.86)
2	103 (52.28)	15 (60.00)	88 (51.16)
3	12 (6.09)	1 (4.00)	11 (6.40)
4	1 (0.51)	0 (0)	1 (0.58)
5	0 (0)	1 (4.00)	0 (0)
Median (IQR) age of children in home (years)			
		2 (1-6)	3 (2-7)

Table 2. Duration and severity of respiratory tract infection symptoms, restricted to first RTI per family with known illness start date (n=197)

RTI duration (days) by percentile							
	All	10th	25th	50th	75th	90th	p-value[a]
All (first RTIs per family) children	197	4	7	9	14	23	-
Consulting[b] and non-consulting[b] children							
Consulting[b]	16	6	9	13	18	37	0.06
Non-consulting[b]	181	4	6	9	13	21	
Upper and lower respiratory tract symptoms							
Exclusively upper[d] RTI symptoms	86[c]	3	5	8	11	15	<0.001
Any lower[d] RTI symptoms	104[c]	6	8	12	18	29.5	
Constitutional symptom severity (mean maximum) score[e] by upper[d] and lower[d] RTI							
				Upper[d] RTI		*Lower[d] RTI*	
Fever				0.55		1.07	
Fatigue				0.83		1.71	
Disruption to sleep				1.15		2.19	
Disruption to other activities				0.67		1.43	

[a] Log-rank test for difference between consulting and non-consulting episodes

[b] Any NHS primary care attendance according to medical notes

[c] 7 RTI episodes which did not report any URTI or LRTI-defining symptoms

[d] Parent reported upper RTI symptoms: earache, sore throat, runny/blocked nose, ear discharge, dry cough or barking/croupy cough. Parent reported lower RTI symptoms: wet/productive cough, breathing faster/shortness of breath, or wheeze/whistling chest

[e] Maximum of daily scores in first 21 days, based on Likert scale zero ('normal, no problem') to six ('as bad as it could be')

Table 3: Effect of deprivation/baseline characteristics on respiratory tract symptom duration and NHS consultations, restricted to first RTI per family with illness start date (n=197)

	Total	**Primary care consultation N (%, 95% CI)**			
Evidence of ≥1 primary care consultation	197	16 (8.1%, 95% CI 4.7% to 12.8%)			
	Total	**Primary care consultation N (%)**	**p-value**	**Median duration (days)**	**p-value**
Parent education level					
No official qualification	2	0 (0)	0.93	1	0.09
GCSEs/GCE/O-levels	6	0 (0)		14	
A-levels/NVQs/GNVQs	9	1 (11.1)		7	
First degree/diploma/HNC/HND	105	9 (8.6)		10	
Higher degree (MSc/PhD)	67	5 (7.5)		9	
Missing	8	1 (12.5)		7	
Age of child					
≤3 years	106	9 (8.5)	0.87	11	<0.01
>3 years	91	7 (7.7)		7	
Missing	0				
Household Index of Multiple Deprivation					
1 (most deprived)	74	5 (6.8)	0.83	9	0.79
2	57	5 (8.8)		9	
3 (least deprived)	63	6 (9.5)		9	
Missing	3	0		23	

Table 4. Sensitivity analyses for overall RTI duration and duration stratified by child's NHS attendance[a]

		RTI duration (days) by percentile					
	N	10th	25th	50th	75th	90th	p-value[b]
Primary comparison (as per Table 2)							
First RTI per family							
All	197	4	7	9	14	23	-
Consulting[a]	16	6	9	13	18	37	0.06
Non-consulting[a]	181	4	6	9	13	21	
Sensitivity analyses							
First RTI per child							
All	246	4	7	9	14	23	-
Consulting[a]	18	6	11	13	18	37	0.05
Non-consulting[a]	228	4	6	9	14	21	
All RTIs							
All	338	4	7	10	15	26	
Consulting[a]	34	8	13	14	27	28	<0.01
Non-consulting[a]	304	4	6	9	14	21	

[a] Any NHS attendance according to medical notes

[b] Log-rank test for difference between consulting and non-consulting episodes